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GLOBAL OBSERVATION INFORMATION NETWORK (GOIN): OVERVIEW OF U.S.-JAPAN ATMOSPHERE-OCEAN PROJECTS

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1. BACKGROUND AND INTRODUCTION

The Global Observation Information Network (GOIN) was implemented under the United States-Japan Framework for a New Economic Partnership which was initiated in April 1993. GOIN is a cooperative effort between the United States and Japan to strengthen bilateral cooperation in Earth observation information networks, involving both satellite and in-situ data. The GOIN initiative is jointly organized by the National Oceanic and Atmospheric Administration (NOAA) in the U.S. and the Science and Technology Agency (STA) in Japan. Participating Japanese agencies include STA, Environmental Agency, Ministry of Foreign Affairs, Ministry of Education, Science, Sports and Culture, Ministry of Agriculture, Forestry and Fisheries, Ministry of International Trade and Industry, Ministry of Transport, Ministry of Posts and Telecommunications, and Ministry of Construction. Participating U.S. agencies include the Department of State, the Department of Commerce, and the National Oceanic and Atmospheric Administration, the Department of the Interior, the National Aeronautics and Space Administration, and additional cooperating entities in both the U.S. and Japan. History, background, and organization are described at http://se.eorc.nasda.go.jp/.

The purpose of GOIN is to provide a framework for the coordination or development of interoperable global networks to support global change research, disaster monitoring, and collaboration in analyzing and using satellite and in-situ data. Pilot projects that demonstrate GOIN network interconnectivity and data exchange, in support of global change research, fall into three subgroups: Atmosphere and Oceans, Land, and Solar-Terrestrial Environment. A network subgroup has been proposed to support the bandwidth and quality of service for network requirements of the pilot projects. U.S.-Japan pilot projects were demonstrated at the GOIN 97 meetings, held in Boulder, Colorado, June 23–27, 1997. This paper presents an overview of the activities of the Atmosphere-Ocean Subgroup (which is chaired by the authors). Web pages for the GOIN 97 activities of the Atmosphere-Ocean Subgroup are on the Web at http://www.pmel.noaa.gov/GOIN/97/.

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2. ATMOSPHERE-OCEAN GOIN PILOT PROJECTS

Current GOIN Atmosphere-Ocean Subgroup pilot projects include the following:

- **JST/NOAA Data Directory Node**
  Objective: Construction of a common system for metadata search
  Principal investigators:
  Japan — Yoshiyuki Maeda (JST)
  U.S. — Gerald S. Barton (NOAA/ESDIM)

- **ADCP Data On-line Service System**
  Objective: Data service for shipboard Acoustic Doppler Current Profiler (ADCP) data
  Principal investigators:
  Japan — Norio Baba (JODC)
  U.S. — Robert D. Gelfeld (NODC)

- **Deep Seafloor Image Database**
  Objective: A system to provide access via the network to a database of deep seafloor images
  Principal investigators:
  Japan — Kiyoshi Otsuka (JAMSTEC)
  U.S. — Nancy Soreide (NOAA/PMEL)

- **Improvement of user interface with Java**
  Objective: To use Java to construct a user interface for access to earth observation data
  Principal investigators:
  Japan — Tetsuo Nakazawa (JMA/MRI)
  U.S. — Nancy Soreide (NOAA/PMEL)

- **NASA/EOSDIS and NASDA/EOIS catalog interoperability**
  Objective: To promote catalog interoperabililty for earth observation satellite and in-situ data
  Principal Investigators:
  Japan — Atsushi Matsuda, NASDA/EOC
  U.S. — Yonsook Enloe, NASA/GSFC

- **EPIC in-situ data system**
  Objective: Data and software exchange; research collaboration
  Principal Investigators:
  Japan — Kiyoshi Otsuka (JAMSTEC/ESTO)
  U.S. — Nancy Soreide (NOAA/PMEL)

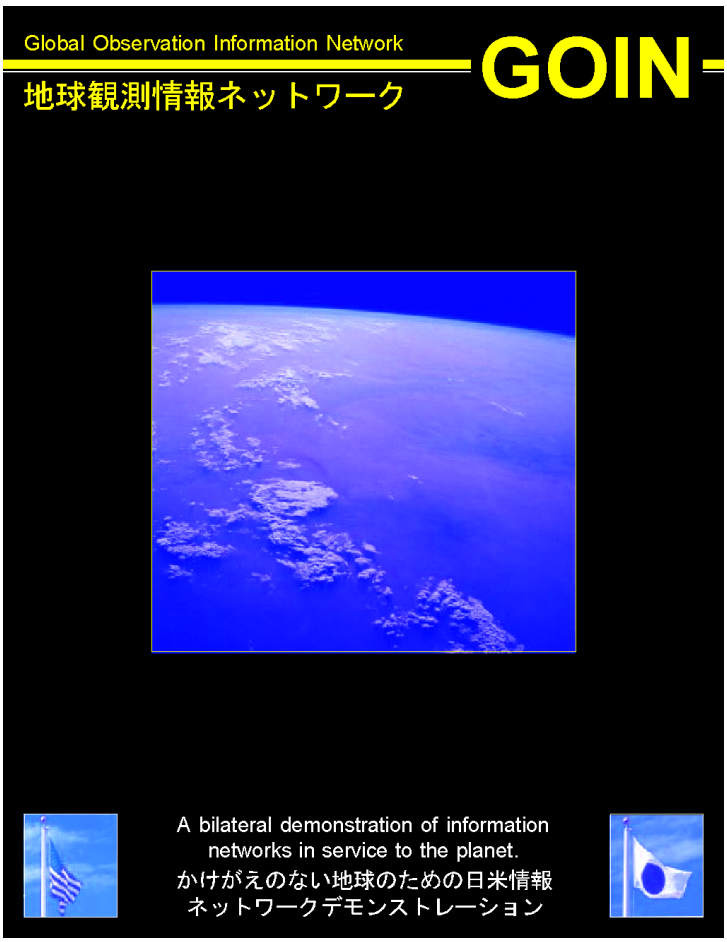

Figure 1. Global Observation Information Network.

- **TAO/TRITON buoy network data integration**
  Objective: The TAO array consists of 70 buoys in the equatorial Pacific. Japanese TRITON buoys are scheduled to replaced TAO buoys in the western Pacific at up to 20 sites by 2000. Objective is data exchange and distribution of data as a unified, integrated dataset.
  Principal Investigators:
  Japan — Yoshifumi Kuroda
  U.S. — Nancy Soreide

- **Ocean observation collaboration between JMA and PMEL**
  Objective: Exchange of historical and recently collected oceanographic and meteorological data collected in the Pacific Ocean
  Principal investigators:
  Japan — Tadashi Asoh (JMA)
  U.S. — Linda Mangum (NOAA/PMEL)

Additional pilot projects were proposed at the June 1997 meeting, and are presently being considered for inclusion in the GOIN framework.

3. GOIN 97 MEETING RESULTS

3.1 *Atmosphere-Ocean Subgroup Demonstrations at the GOIN 97 Meeting*

ADCP Data On-line Service System
http://www.jodc.jhd.go.jp/goin/goin.html
Dr. Baba, JODC
Mr. Pat Caldwell, NODC
– Make ADCP data available on-line
– Exchange ADCP data between U.S. and Japan

TAO Data Access
http://www.pmel.noaa.gov/toga-tao/realtime.html
Nancy Soreide, NOAA/PMEL
Kioyshi Otsuka, STA/JAMSTEC

EPIC In-Situ Ocean Data Access
http://www.pmel.noaa.gov/toga-tao/ams97/epic/
Nancy Soreide, NOAA/PMEL
Kioyshi Otsuka, STA/JAMSTEC
– Software for management, display, and analysis of ocean data

NOAAServer: Unified Access to Distributed NOAA Data

http://www.pmel.noaa.gov/GOIN/97/NOAAServer.html

Nancy Soreide, NOAA

– Central access to distributed NOAA data holdings
– Search criteria include JAVA map, keywords, time, etc.
– Search leads to metadata and on-line data

JST Node of the NOAA Data Directory

Gerald Barton, NOAA/NESDIS

– FGDC meta data search and results
– The NOAA Data Directory is being incorporated into the NOAA Server

Deep Sea Floor Image Data Base

Dr. Otsuka, JAMSTEC

– Live demo retrievals produce album IDs and then images
– Software also to be used by WHOI

Interactive Image Spread Sheet

http://se.eorc.nasda.go.jp/GOIN/GOIN_workshop/agenda_1.3.c.4/agenda_1.3.c.4.html

Kannappan Palaniappan, University of Missouri–Columbia/GSFC

Fritz Hassler, NASA/GSFC

– Multi-source data set integration
  GOES water vapor sequence
  Data mechanics
– K Max convective moisture experiment
  Data formats for images include:
    Grads files,
    HDF (Eos Program),
    Raw,
    Several images: PNN, JPEG, TIFF, GIF.
– Multiple native projections on adjacent panels, e.g.,
  Lightning data over GOES IR images (Spherics),
  GOES Indian monsoon,
  Micro physics data sets, WISP data set, nested grids.

ADEOS Data Use for Atmosphere-Ocean Study

Dr. Moriyama, NASDA

– Presentation NSCAT data, OCTS data
  Early data contained errors
  Current data for new S/W is greatly improved since April 97
  Still tuning algorithms
  Calibration/validaton of OCTS
  Wind vectors
  GMS clouds and ocean winds
  NASDA buoy YBOM

Improvement of User Interface in JMA/MRI Database

Dr. Nakazawa, JMA/MRI

– Search page for data, display, download
– Crossection of temperature versus latitude
– Time window

ILAS, RIS Data Information System

Dr. Uehiro, NIES

– Demo metadata and data, ordering
– Ozone N&S Pole coverages
– Map box retrievals attempts
– Unzip previous file

Simultaneous Interoperability Demonstration

NASDA/EOIS
http://www.eoc.nasda.go.jp
NASA/EOSDIS
http://eos.nasa.gov/imswelcome

5. CONCLUSION

The Global Observation Information Network (GOIN) is a cooperative effort between the United States and Japan to strengthen bilateral cooperation in Earth observation information networks, involving both satellite and in-situ data.

Results of GOIN pilot projects that demonstrate current capabilities and resources to exchange global observation data and information between agencies of the United States and Japan were presented at the GOIN 97 meeting June 23–27, 1997 in Boulder, Colorado (http://www.ngdc.noaa.gov/stp/GOIN/). Pilot projects within the Atmosphere-Ocean Subgroup (http://www.pmel.noaa.gov/GOIN/97/) demonstrate exchange of various satellite and in-situ datasets, and use of very high speed networks to facilitate that exchange. These pilot projects provide operational experience for global observation data exchanges over electronic networks, and form a basis for ongoing bilateral (agency-to-agency) discussions of cooperation and exchanges of global data and information. They demonstrate the willingness of both the United States and Japanese Governments to make their data sets available to facilitate the analysis and use of global observation data.